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Automation of nucleic acid extraction for NAT screening of individual blood units.

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BACKGROUND: Automation of NAT for single units of blood is currently hampered by the labor-intensive steps involved in the extraction of nucleic acids from samples before the amplification procedures. A new method has been developed for the automation of these steps using hydrophilic polyvinylidene fluoride (PVDF) filter plates. STUDY DESIGN AND METHODS: Quantitative nucleic acid recoveries from sera containing HCV, HIV, HBV, HAV, and human parvovirus B19 and from 3H-labeled HCV RNA were determined in parallel by th semi-automated PVDF method and a single-column method (Qiagen). Quantitative PCR was performed. RESULTS: Similar recoveries of HCV, HIV, and HBV (with silica beads) were observed with the PVDF method and with the Qiagen single-column method. The sensitivity of the PVDF-based PCR assay for HCV, HI and HBV in serially diluted serum samples was always within two serial dilutions that obtained when the Qiagen single-column method was used in the same assays. With the use of 3H-labeled HCV RNA, recoveries of approximately 70 percent we found by both methods. CONCLUSION: The PVDF method will permit full automation of the simultaneous extraction of nucleic acid from sera containing HC HIV, and HBV. This procedure will permit NAT screening of individual units of blood, will replace the current screening of pools, and will achieve improved blooc safety with reduced labor and costs.

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